TN-5508/5516 Series

EN50155 8/16-port managed Ethernet switches

- **M12 connectors for robust links**
- **Wide power input range from 12 to 110 VDC (LV-MV model)**
- **Isolated redundant power inputs with universal 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC power supply range**
- **EN50155/50121-3-2/50121-4, NEMA TS2, and e-Mark compliant**
- **-40 to 75°C operating temperature range (T models)**
- **Turbo Ring, Turbo Chain, and IEEE 802.1D-2004 RSTP/STP for Ethernet redundancy**

Introduction

The ToughNet TN-5508/5516 series M12 managed Ethernet switches are designed for industrial applications in harsh environments. The TN series switches use M12 and other circular connectors to ensure tight, robust connections, and guarantee reliable operation against environmental disturbances, such as vibration and shock. The TN-5500-LV-MV switches provide the wide power input range of 12/24/36/48/72/96/110 VDC that allows you to the same type of power source at different sites around the globe. In addition, the 12/24/36/48 VDC, 72/96/110 VDC, or 110/220 VDC/VAC dual, isolated redundant power supply increases the reliability of your communications and saves on cabling/wiring costs. The TN-5508/5516 switches provide up to 8 or 16 fast Ethernet M12 ports. Models with an extended operating temperature range of -40 to 75°C are also available. The TN-5500 series Ethernet switches are compliant with EN50155/50121-3-2/50121-4 (railway applications), NEMA TS2 (traffic control systems), and e-Mark (vehicles) requirements, making the switches suitable for a variety of industrial applications.

Features and Benefits

- Three rotary switches for setting the last 3 digits of the IP address makes maintenance even easier
- IPv6 Ready logo awarded (IPv6 Logo Committee certified)
- Leading EN50155-compliant industrial Ethernet switches for rolling stock applications
- DHCP Option 82 for IP address assignment with different policies
- Modbus/TCP industrial Ethernet protocol supported
- Turbo Ring, Turbo Chain, and IEEE 802.1D-2004 RSTP/STP for network redundancy
- IGMP snooping and GMRP for filtering multicast traffic
- Port-based VLAN, IEEE 802.1Q VLAN, and GVRP to ease network planning
- QoS (IEEE 802.1p/1Q and TOS/DiffServ) to increase determinism
- IEEE 802.3ad, LACP for optimum bandwidth utilization
- SNMPv3, IEEE 802.1X, HTTPS, and SSH to enhance network security
- SNMPv1/v2c/v3 for different levels of network management
- RMON for efficient network monitoring and proactive capability
- Bandwidth management prevents unpredictable network status
- Lock port allows access by only authorized MAC addresses
- Port mirroring for online debugging
- Automatic warning by exception through email, relay output
- Line-swap fast recovery
- Automatic recovery of connected device's IP addresses
- LLDP for automatic topology discovery in network management software
- Configurable by web browser, Telnet/serial console, and Windows utility
- Panel mounting or DIN-Rail mounting installation capability

Specifications

Technology

Standards:
IEEE 802.3 for 10BaseT
IEEE 802.3u for 100BaseT(X)
IEEE 802.3ab for 1000BaseT(X)
IEEE 802.3x for Flow Control
IEEE 802.1D for Spanning Tree Protocol
IEEE 802.1w for Rapid STP
IEEE 802.1Q for VLAN Tagging
IEEE 802.1p for Class of Service
IEEE 802.1X for Authentication
IEEE 802.3ad for Port Trunk with LACP

Protocols: IGMPv1/v2, GMRP, GVRP, SNMPv1/v2C/v3, DHCP Server/Client, DHCP Option 66/67/82, BootP, TFTP, SNTP, SMTP, RARP, RMON, HTTP, HTTPS, Telent, SSH, Syslog, LLDP, IEEE 1588 PTP, Modbus/TCP, IPv6
MIB: MIB-II, Ethernet-like MIB, P-BRIDGE MIB, Q-BRIDGE MIB, Bridge MIB, RSTP MIB, RMON MIB Group 1, 2, 3, 9
Flow Control: IEEE802.3x flow control, back pressure flow control

Switch Properties

Priority Queues: 4
Max. Number of Available VLANs: 64
VLAN ID Range: VID 1 to 4094
IGMP Groups: 256

Interface

Fast Ethernet: Front cabling, M12 connector, 10/100BaseT(X) auto negotiation speed, F/H duplex mode, and auto MDI/MDI-X connection
Console Port: M12 A-coding 5-pin male connector
System LED Indicators: PWR1, PWR2, FAULT, MSTR/HEAD, CPLR/TAIL
Port LED Indicators: 10/100M
Alarm Contact: 2 relay outputs in one M12 A-coding 5-pin male connector with current carrying capacity of 3 A @ 30 VDC
Rotary Switches: For setting the last 3 digits of the IP address

Power Requirements

Input Voltage:
- LV: 12/24/36/48 VDC (8.4 to 60 VDC)
- MV: 72/96/110 VDC (50.4 to 154 VDC)
- HV: 110/220 VDC/VAC (88 to 300 VDC, 85 to 264 VAC)

Input Current:
- TN-5508 Series: 0.234 A @ 24 VDC, 0.104 A @ 72 VDC, 0.072 A @ 110 VDC, 0.18 A @ 110 VAC, 0.12 A @ 220 VAC
- TN-5516 Series: 0.338 A @ 24 VDC, 0.133 A @ 72 VDC, 0.089 A @ 110 VDC, 0.270 A @ 110 VAC, 0.170 A @ 220 VAC

Overload Current Protection: Present
Connection: M23 connector
Reverse Polarity Protection: Present

Physical Characteristics

Housing: Metal, IP54 protection (optional protective caps available for unused ports)
Dimensions:
TN-5508 Series: 185 x 170 x 69.8 mm (7.28 x 6.69 x 2.75 in)
TN-5516 Series: 250 x 170 x 69.8 mm (9.84 x 6.69 x 2.75 in)
Weight:
TN-5508 Series: 1650 g
TN-5516 Series: 2500 g
Installation: Panel mounting, DIN-Rail mounting (with optional kit)

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Operating Humidity: 5 to 95% RH (non-condensing)

Regulatory Approvals

Safety: UL508 (Pending)
EMI: FCC Part 15, CISPR (EN55022) class A
EMS:
EN61000-4-2 (ESD), Level 3
EN61000-4-3 (RS), Level 4
EN61000-4-4 (EFT), Level 3
EN61000-4-5 (Surge), Level 3
EN61000-4-6 (CS), Level 3
EN61000-4-8
EN61000-4-11
EN61000-4-12
Traffic Control: NEMA TS2 (Pending)
Road Traffic: e-Mark (Pending)
Rail Traffic: (for panel mounting installations)
EN50155 (Pending), EN50121-3-2 (Pending), EN50121-4 (Pending)
Shock: IEC61373
Freefall: IEC60068-2-32
Vibration: IEC61373

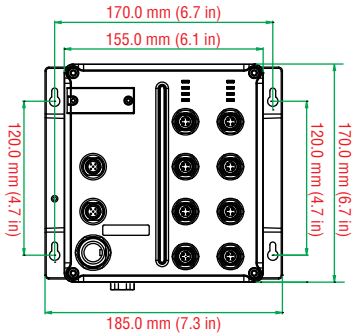
Note: Please check Moxa's website for the most up-to-date certification status.

Warranty

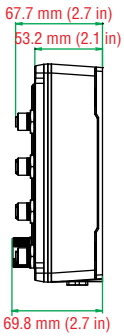
Warranty Period: 5 years
Details: See www.moxa.com/warranty

Dimensions

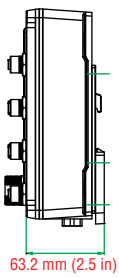
TN-5508 Series



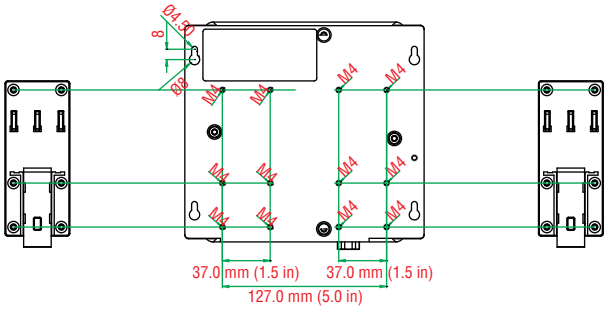
Front View



Side View

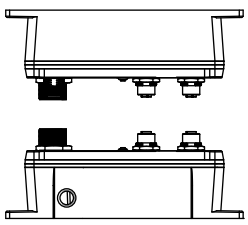


Side View (including DIN-Rail Mounting Kit)



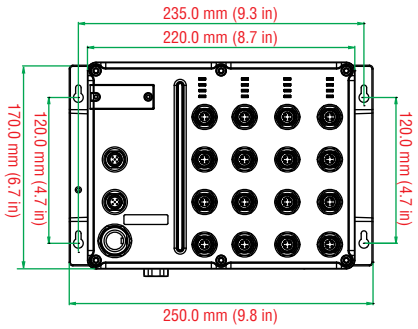
DIN-Rail Mounting Kit

Rear View

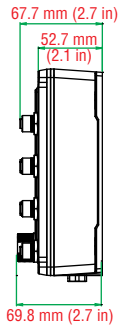

Top & Bottom Views

Dimensions

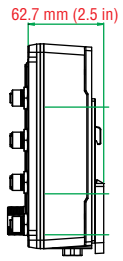
TN-5516 Series



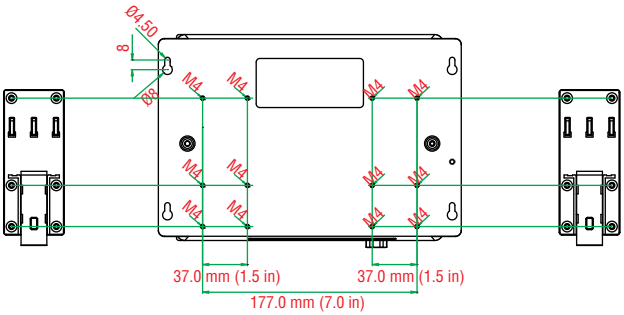
Front View



Side View

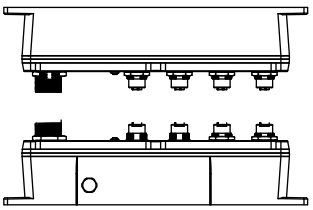


Side View (including DIN-Rail Mounting Kit)



DIN-Rail Mounting Kit

Rear View



Top & Bottom Views

Ordering Information

Available Models		Port Interface	Power Supply					
			Power Supply 1			Power Supply 2		
			LV	MV	HV	LV	MV	HV
Standard Temperature (0 to 60°C)	Wide Temperature (-40 to 75°C)	10/100 BaseT(X) M12 connector	12/24/36/48 VDC (8.4 to 60 V), non-isolated	72/96/110 VDC (50.4 to 154 V), isolated	88 to 300 VDC and 85 to 264 VAC, isolated	12/24/36/48 VDC (8.4 to 60 V), non-isolated	72/96/110 VDC (50.4 to 154 V), isolated	88 to 300 VDC and 85 to 264 VAC, isolated
TN-5508 Series								
TN-5508-LV-LV	TN-5508-LV-LV-T	8	1	–	–	1	–	–
TN-5508-LV-MV	TN-5508-LV-MV-T	8	1	–	–	–	1	–
TN-5508-LV-HV	TN-5508-LV-HV-T	8	1	–	–	–	–	1
TN-5516 Series								
TN-5516-LV-LV	TN-5516-LV-LV-T	16	1	–	–	1	–	–
TN-5516-LV-MV	TN-5516-LV-MV-T	16	1	–	–	–	1	–
TN-5516-LV-HV	TN-5516-LV-HV-T	16	1	–	–	–	–	1
TN-5516-MV-MV	TN-5516-MV-MV-T	16	–	1	–	–	1	–
TN-5516-MV-HV	TN-5516-MV-HV-T	16	–	1	–	–	–	1
TN-5516-HV-HV	TN–5516–HV–HV–T	16	–	–	1	–	–	1

MC-4615-C23-XPE (Available by project-based orders)

x86 Ready-to-Run Computer with Intel Core 2 Duo, VGA, DVI-I, Audio, 2 LANs, 2 Serial Ports, 6 DI, 2 DO, 2 USB 2.0 Ports, CF, HDD

- Intel Core 2 Duo SP9300 2.26 GHz processor, 1066 MHz FSB
- 2 GB DDR3 SODIMM system memory
- Dual Independent Displays (VGA + DVI-I)
- 2 RS-232/422/485 serial ports (DB9)
- 2 10/100 Mbps Ethernet Ports (M12)
- 2 USB 2.0 ports for high speed peripheral
- 6 DI + 2 DO
- CompactFlash socket for storing OS
- LED indicators for power and storage
- Ready-to-run Windows Embedded Standard 2009 platform

Overview

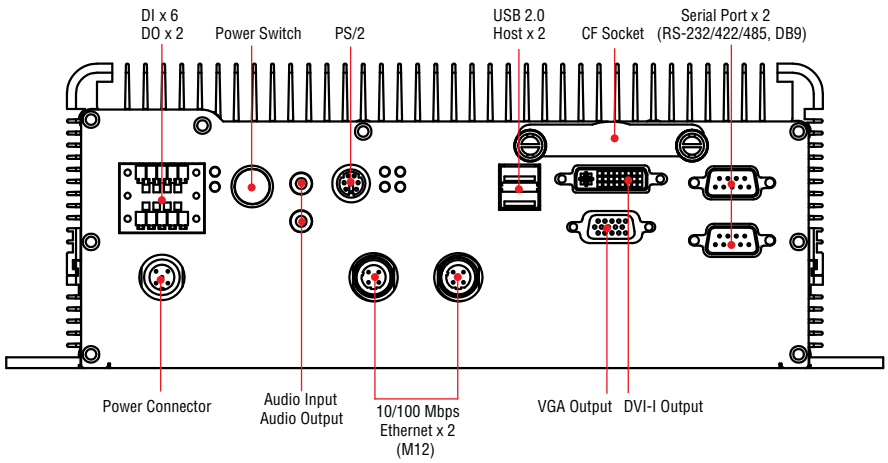
The MC-4615-C23-XPE (TM) computer is based on the Intel Core 2 Duo x86 processor, and feature 2 serial ports, dual LAN ports, 2 USB 2.0 hosts, and a CF card socket. The MC-4615-C23-XPE (TM) offers both VGA and DVI-I outputs, making it particularly well-suited for industrial applications, such as marine, SCADA and manufacturing automation.

The MC-4615-C23-XPE (TM) computer's 2 serial ports make them ideal for connecting a wide range of serial devices, and the dual 10/100 Mbps Ethernet ports with M12 connectors offer a reliable solution for network redundancy, promising continuous operation for data communication and management. As an added convenience, the MC-4615-C23-XPE (TM) computers have 6 DIs and 2 DOs for connecting digital input/output devices. In addition, the CompactFlash and USB sockets provide the MC-4615-C23-XPE (TM) computer with the reliability needed for industrial applications that require data buffering and storage expansion.

Pre-installed with Windows Embedded Standard 2009 platform, the MC-4615-C23-XPE (TM) provides programmers with a friendly environment for developing sophisticated, bug-free application software at a lower cost.

Appearance

Front View



Hardware Specifications

Computer

CPU: Intel Core 2 Duo SP9300 2.26 GHz processor, 6 M for L2 cache)
OS (pre-installed): Windows Embedded Standard 2009
System Chipset: Intel GS45 + ICH9-M
FSB: 1066 MHz
System Memory: 1 x 200-pin DDR3 SODIMM, built-in 2 GB
USB: USB 2.0 compliant hosts x 2, type A connector

Storage

Storage Expansion: CompactFlash socket for CF card expansion, supporting CF Type-I/II socket with DMA mode
HDD Support: 2 SATA-150 connectors for hard drive support

Other Peripherals

KB/MS: 1 PS/2 interface supporting standard PS/2 keyboard and mouse through Y-type cable
Audio: AC97 audio, with line-in interface
Expansion: Reserves 1 mini PCIe slot

Display

Graphical Controller: Intel GS45 Integrated Graphics Engine
Display Interface:
CRT interface for VGA output (DB15 female connector)
DVI interface via DVI-I connection

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports
Magnetic Isolation Protection: 1.5 KV built-in
Connector Type: M12

Serial Interface

Serial Standards:
2 RS-232/422/485 ports, software selectable (DB9 male)
ESD protection: 15 KV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF
Baudrate: 50 bps to 921.6 Kbps

Serial Signals

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

LEDs

System: Power x 1, Storage x 1
LAN: 10 M Act/Link x 2, 100M Act/Link x 2

Switches and Buttons

Switch: Power on/off x 1 (front side)
Power Connector: M12 (rear side)

Physical Characteristics

Housing: Aluminum
Weight: 3.75 kg
Dimensions: 250 x 287 x 101 mm (9.84 x 11.30 x 3.98 in)
Mounting: Wall

Environmental Limits

Operating Temperature: -10 to 55°C (14 to 131°F)
Relative Humidity: 5%~95% non-condensing
Storage Temperature: -20 to 60°C (-4 to 140°C), 5 to 95% RH

Power Requirements

Power Input: 24 VDC
Power Connector: M12

Regulatory Approvals

EMC: FCC, CE (Class A), IEC 60571 Edition 2.1:2006-12
Safety: UL/cUL, LVD, IEC 60571 Edition 2.1:2006-12
Green Product: RoHS, cRoHS, WEEE

Reliability

Watchdog Timer: Supports software programmable 1-255 levels interval timer
RTC: Yes, with lithium battery backup

Warranty

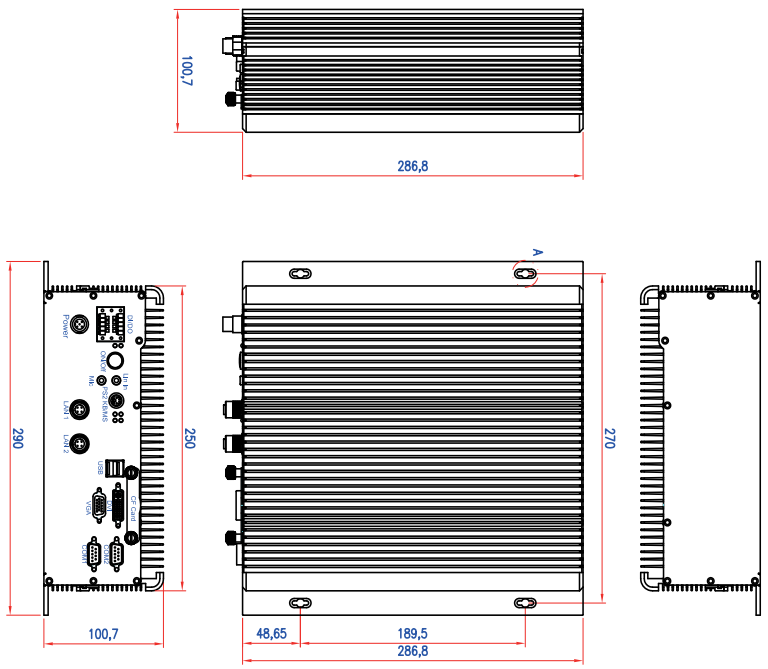
Warranty Period: 3 years
Details: See www.moxa.com/warranty

Software Specifications

Windows XP Embedded

Version: Windows Embedded Standard 2009
System Utilities: Windows command shell, Telnet, ftp, web-based administration manager, Wireless Zero Configuration
File System: NTFS
Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, FTP, SMTP, PPPoE, PPTP, NetBIOS, remote Desktop Protocol 6.1
Telnet Server: Allows users to connect to Telnet servers from remote computers.
IIS Web Server: Allows you to create and manage Web sites.
Terminal Server: Microsoft Terminal Server client application (mstsc.exe).
COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).
Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. Allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.
Internet Explorer 7: The Internet Explorer Web browser that allows customers to connect to the Internet or to an intranet (see properties via inetcpl.cpl)
Windows Media Player 11: Playback functionality for digital media that includes videos, CDs, and DVDs for end users and developers.
Wi-Fi protected access 2: Enhances the Windows XP wireless client software with support for the new Wi-Fi Alliance certification for wireless security
Silverlight 1.1: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework.
Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other
changes in the storage subsystem.
Remote Registry Service: Enables remote users to modify registry settings on this computer.
Watchdog: A hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function).
Enhanced Write Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage
Application Development Software:
- Microsoft .Net Framework 3.5 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate
- Autoenrollment (CLR and the .NET Framework class library)
- COM APIs
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Event Log, Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- Registry Filter
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with USB .95 or 1.0
- Windows API, Script Engines, and WMI
- XML paper specification

Dimensions



Ordering Information

Available Models

MC-4615-C23-XPE (TM): x86 Ready-to-Run Embedded Computer with Intel Core 2 Duo, VGA, DVI-I, Audio, 2 LANs, 2 Serial Ports, 6 DIs, 2 DOs, 2 USB 2.0 Ports, CF, Windows Embedded Standard 2009

Optional Accessories (can be purchased separately)

PWR-24250-DT-S1: Power adaptor
PWC-C7US-2B-183: Power cord with USA plug
PWC-C7EU-2B-183: Power cord with Euro plug
PWC-C7UK-2B-183: Power cord with British plug
PWC-C7AU-2B-183: Power cord with Australia plug
PWC-C7CN-2B-183: Power cord with China plug

Package Checklist

- MC-4615-C23-XPE (TM) Embedded Computer
- Terminal Block to Power Jack Converter
- Wall mounting Kit
- Document and Software CD or DVD
- Quick Installation Guide (printed)
- Product Warranty Statement (printed)

V2416 Series (Available by project-based orders)

x86-based industrial computer with Intel Atom N270, Dual LANs (M12 connector), 4 serial port, 6 DI, 2 DO, VGA, DVI-I, 3 USB hosts, 2 SATA storage connectors

- **Intel Atom N270 1.6 Ghz, 512K Level 2 cache**
- **Built-in 1G DDR2 system memory**
- **Dual independent displays (VGA, DVI-I selectable)**
- **4 RS-232/422/485 serial ports, supporting non-standard baudrates**
- **3 USB 2.0 hosts**
- **6 DI, 2 DO**
- **Supports CompactFlash socket for storage expansion**
- **2 SATA-150 connectors for storage expansion**
- **Non-symmetric leveraged storage socket design (patent pending) for reducing vibration and shock**
- **Ready-to-run Linux or Windows Embedded Standard 2009 platform**

Hardware Specifications

Computer

CPU: Intel Atom N270 1.6 GHz 512K L2 cache
OS (pre-installed): Windows Embedded Standard 2009
System Chipset: Intel 945GSE + ICH7-M
BIOS: 8 Mbit Flash BIOS, SPI type,supporting ACPI function
FSB: 533 MHz
Memory: Built-in 1 GB 200-pin DDR2 system memory
USB: USB 2.0 host x 3, supporting system bootup

Storage

Built-in: 2 GB industrial DOM to store OS
Expansion: CompactFlash socket
HDD: 2 SATA-150 connectors for storage expansion

Peripherals

Keyboard & Mouse: 1 PS/2 interface supporting PS/2 keyboard and mouse through Y-type cable
Audio: Line-in, line-out interface

Display

Graphic Controller: IntelGen 3.5 Integrated Graphics Engine,250 MHz core render clock and 200 MHz core display clock at 1.05-V core voltage
VGA Interface: DB15 female connector
DVI Interface: DVI-I connector (chrontel CH7307 SDVO to DVI transmitter)

Ethernet Interface

LAN: 2 auto-sensing 10/100 Mbps ports (M12 connector)

Serial Interface

Serial Standard:
4 RS-232/422/485 serial ports*, software selectable (DB9 male)
*COM1 pin 9 can be selected as N/C (default),+5V, or +12V by jumper)
ESD Protection: 4 KV for all signals

Serial Communication Parameters

Data Bits: 5, 6, 7, 8
Stop Bits: 1, 1.5, 2
Parity: None, Even, Odd, Space, Mark
Flow Control: RTS/CTS, XON/XOFF, ADDC(automatic data direction control) for RS-485
Baudrate: 50 bps to 921.6 Kbps (non-standard baudrates supported; see user's manual for details)

Serial Signal

RS-232: TxD, RxD, DTR, DSR, RTS, CTS, DCD, GND
RS-422: TxD+, TxD-, RxD+, RxD-, GND
RS-485-4w: TxD+, TxD-, RxD+, RxD-, GND
RS-485-2w: Data+, Data-, GND

Digital Input

Input Channels: 6, source type
Input Voltage: 0 to 30 VDC at 15 Hz
Digital Input Levels:
• Logic level 0: Close to GND
• Logic level 1: Open
Connector Type: Terminal Block

Digital Output

Output Channels: 2, source type, 0 to 5 VDC
Output Current: Max. 20 mA per channel
Output Voltage:
• Logic 0: 0-0.55 V
• Logic 1: 4.2-5.0 V
Connector Type: Terminal Block

LEDs

System: Power, Storage
LAN: 10M/Link x 2, 100M/Link x 2 (on connector)

Switches and Buttons

Power Switch: on/off (front panel)

Reset Button: For warm boot (rear panel)

Physical Characteristics

Housing: Aluminum

Weight: 4 kg

Dimensions:

154 x 250 x 57 mm (6.06 x 9.84 x 2.24 in)

Mounting: DIN-rail, VESA

Environmental Limits

Operating Humidity (without HDD): 5 to 95% RH

Storage Temperature (without HDD): -20 to 80°C

Operatign Tempeature (without HDD): -10 to 60°C (no fan, no heater)

Anti-vibration: 5 g rms @ IEC-68-2-34, random wave, 5-500 Hz, 1 hr/axis

Anit-shock: 50 g @ IEC-68-2-27, half sine wave, 11 ms

Power Requirements

Power Voltage: 12 to 48 VDC

Power Consuption: 26 W

2.16 A @ 12 VDC

1.08 A @ 24 VDC

542 mA @ 48 VDC

Regulatory Approvals

EMC: CE, FCC, IEC 60571 Edition 2.1:2006-12, EN 50155

Green Product: RoHS, CRoHS, WEEE

Reliability

Automatic Reboot Trigger: Built-in WDT (watchdog timer) supporting 1-255 level time interval system reset, software programmable

Warranty

Warranty Period: 3 years

Details: See www.moxa.com/warranty

Software Specifications

Linux

Distribution: Debian Etch 5.0

Kernel Version: 2.6.26

Protocol Stack: TCP, UDP, IPv4, SNMP V1, ICMP, ARP, HTTP, CHAP, PAP, SSH 1.0/2.0, SSL, DHCP, NTP, NFS, Telnet, FTP, PPP, PPPoE

File System: EXT2

System Utilities: bash, busybox, login, telnet, ftp, ssh, openbsd-inetd, apt, apt-utils, dpkg, grub, udev

telnetd: telnet Server daemon

ftpd: FTP server daemon

sshd: secure shell server

Apache: web server daemon, supporting PHP and XML

OpenVPN: virtual private network service manager

iptables: Firewall service manager

NAT: Network Address Translation

pppd: dial in/out over serial port daemon & PPPoE

pppoe: PPP over ethernet

tftp/tftpd: Trivial file transfer protocol client/server

snmpd: snmpd agent daemon

usbmount: supports USB PnP

DHCP Client: dhcp3-client

cron: to manage regular background processing

grep: NU grep, egrep, and fgrep

minicom: friendly serial communication program

watchdog: software watchdog

inetd: TCP server manager program

Application Development Environment: GNU Make 3.8.1 (GNU make utility to maintain groups of programs)

Automatic configuration script builder: autoconf 2.13

gcc: GNU C compiler

g++: GNU C++ compiler

libc6-dev: GNU C library (development libraries and headers)

Perl: Pratical Extraction and Report Language

Vim: Vi IMproved (enhanced vi editor)

Windows XP Embedded

Version: Windows Embedded Standard 2009

File System: NTFS

Protocol Stack: DHCP, IPv4, DNS, IPsec, HTTP, TCP, UDP, ICMP, IGMP, ARP, TAPI, TSP, SNMP V2, NTP, ICS, PPP, CHAP, EAP, SNTP, Telnet, FTP, SMTP, PPPoE, PPTP, NetBIOS, remote Desktop Protocol 6.1

Telnet Server: Allows users to connect to Telnet servers from remote computers.

IIS Web Server: Allows you to create and manage Web sites.

Terminal Server: Microsoft Terminal Server client application (mstsc.exe).

COM+ Services: The next evolution of Microsoft Component Object Model (COM) and Microsoft Transaction Server (MTS).

Computer Browser Service: Computer browsing functionality exposed by Windows through Microsoft Networking. Allows a client machine to browse its network neighborhood for available computers exposing file and print sharing services.

Internet Explorer 7: The Internet Explorer Web browser that allows customers to connect to the Internet or to an intranet (see properties via inetcpl.cpl)

Windows Media Player 11: Playback functionality for digital media that includes videos, CDs, and DVDs for end users and developers.

Wi-Fi protected access 2: Enhances the Windows XP wireless client software with support for the new Wi-Fi Alliance certification for wireless
security

Silverlight 1.1: A free runtime that powers rich application experiences and delivers high quality, interactive video across multiple platforms and browsers, using the .NET framework.

Disk Management Services: Support for disk and volume management operations. The component implements a Component Object Model (COM) interface that can be used to query and configure disks and volumes, both basic and dynamic. The component also monitors disk arrivals and removals and other changes in the storage subsystem.

Remote Registry Service: Enables remote users to modify registry settings on this computer.

Watchdog: A hardware function to reset CPU in a user specified time interval (triggered by calling a MOXA library function).

Enhanced Write Filter: Redirect disk write operations to volatile (RAM) or non-volatile (disk) storage

Application Development Software:

- Microsoft .Net Framework 3.5 (CLR and the .NET Framework class library)
- Active Directory Service Interface (ADSI) Core
- Active Template Library (ATL),ASP.NET 2.0
- Certificate Request Client & Certificate Autoenrollment
- Common Control Libraries
- Common File Dialogs
- Direct3D, DirectPlay, DirectShow and Direct show filters
- Distributed Transaction Coordinator (MSDTC)
- Event Log, Internet Explorer
- Mapi32 Libraries
- Message Queuing (MSMQ) Core
- Microsoft Visual C++ Run Time Libraries
- Power Management dynamic-link library
- Registry Editor
- Registry Filter
- RPC
- Smart Card Cryptographic Service Providers
- USB 2.0 core drivers compliant with USB .95 or 1.0
- Windows API, Script Engines, and WMI
- XML paper specification

Ordering Information

Available Models

V2416-XPE: x86-based industrial computer with Intel Atom N270, Dual LANs (M12 connector), 4 serial port, 6 DI, 2 DO, VGA, DVI-I, 3 USB hosts, 2 SATA storage connectors

V2416-LX: x86-based industrial computer with Intel Atom N270, Dual LANs (M12 connector), 4 serial port, 6 DI, 2 DO, VGA, DVI-I, 3 USB hosts, 2 SATA storage connectors

Package Checklist

- V2416 embedded computer
- Wall Mounting Kit
- DIN-Rail Mounting Kit
- Power jack converter with terminal block
- Document and Software CD or DVD
- Quick Installation Guide (printed)
- Warranty Card

VPort 364-M12 Series

Excellent video quality, 4-channel H.264 industrial video encoders

- Dual simultaneous video streams for H.264 and MJPEG
- Video stream up to 30/25 frames/sec at full D1 (NTSC: 720 x 480; PAL: 720 x 576) resolution
- Video latency under 200 ms
- Built-in M12 Ethernet connector designed for high vibration rolling stock applications
- Industrial design with -40 to 75°C operating temperature
- Compliance with EN50155 and IEC60571 rolling stock criteria
- VPort SDK PLUS provided free

Introduction

The VPort 364-M12 is a 4-channel industrial video encoder specially designed for rolling stock applications. It provides an anti-vibration M12 Ethernet connector, and compliant with the EN50155 (2007) and IEC60571 (Edition 2.1: 2006-12) criteria in performance, shock, vibration, operating temperature and EMC. In video stream, the VPort 364-M12 adopts the most advanced H.264 video compression technology for providing the best video quality, but with a smaller bandwidth requirement than other video compression standards. A MJPEG video stream is also provided for meeting the low frame rate transmission and storage requirement. Therefore, the VPort 364-M12 can provide dual video streams, one for H.264 and the other for MJEPG, simultaneously for each video channel. In addition, with the industrial rugged design features, which include -40 to 75°C operating temperature, IP30 form factor protection, and industrial certifications, make the VPort 364-M12 more suitable for harsh environments.

Specifications

Video

Video Compression: H.264 (MPEG4 part 10, AVC) or MJPEG
Video Inputs: 4, BNC connector (1.0 Vpp, 75 ohms)
Video Streams: Dual streams (One for H.264, the other for MJPEG)
NTSC/PAL: Auto-sensing or manual
Video Resolution and FPS (frames per second) in single video stream:

	NTSC		PAL	
	Size	Max. FPS	Size	Max. FPS
Full D1	720 x 480	30	720 x 576	25
4CIF	704 x 480	30	704 x 576	25
VGA	640 x 480	30	640 x 480	25
CIF	352 x 240	30	352 x 288	25
QCIF	176 x 112	30	176 x 144	25

Note: When enabling the H.264 and MJPEG video streaming simultaneously, the total FPS of these 2 video streams will be about 30 FPS. For example, once MJPEG is setup in 10 FPS, the H.264 is 20 FPS.

Video Viewing:
• Adjustable image size and quality
• Timestamp and text overlay

Audio

Audio Inputs: 2, Line-in or MIC-in with RCA connector
Audio Format: Mono, PCM

Network

Protocols: TCP, UDP, HTTP, SMTP, FTP, NTP, DNS, DHCP, UPnP, RTP, RTSP, ICMP, IGMPv3, QoS, SNMPv1/v2c/v3, DDNS
Ethernet: 1 10/100BaseT(X) auto negotiating M12 port

Serial Port

PTZ Ports: 1, RS-232/422/485 port (5-pin terminal block connector), max. speed of 115.2 Kbps
Console Port: 1 RS-232 RJ45 port

GPIO

Digital Inputs: 8, max. 8 mA
High: +13 to +30 V; Low: -30 to +3 V
Relay Outputs: 2, max. 24 VDC @ 1 A

LED Indicators

STAT: System status
PWR1: Power 1
PWR2: Power 2
FAULT: Can be configured to correspond to system alarm, power failure, or disconnected network
V1, V2, V3, V4: 1, 2, 3, 4 video input signal activity

Power Requirements

Input Voltage: 2 12 VDC or 24 VDC/VAC inputs for redundancy, terminal block connector
Power Consumption: Max. 7 watts

Physical Characteristics

Housing: Metal, IP30 protection
Dimensions: 80.2 x 135 x 105 mm (3.16 x 5.31 x 4.13 in)
Installation: Panel mounting (default with WK-46 mounting kit) or DIN-Rail mounting (optional with DIN-Rail kit)

PAN/TILT/ZOOM

PTZ Camera Control: Via RS-232/422/485 PTZ port
PTZ Control Functions: PAN, TILT, ZOOM, FOCUS, moving speed, preset position (max. 25 positions), and 24 custom commands

PTZ Function Updates: Driver upload supported
Supported Device Protocols: Pelco D, Pelco P, Dynacolor DynaDome,Yokogawa (Fieldeye), Cohu and Custom Camera
Transparent PTZ Control: Control PTZ cameras with legacy PTZ control panel or keyboard connected to a PC or VPort decoder

Security

Password: User level password protection
Filtering: By IP address

Environmental Limits

Operating Temperature:
Standard Models: 0 to 60°C (32 to 140°F)
Wide Temp. Models: -40 to 75°C (-40 to 167°F)
Storage Temperature: -40 to 85°C (-40 to 185°F)
Ambient Relative Humidity: 5 to 95% (non-condensing)

Regulatory Approvals

EMS:
EN61000-4-2 (ESD), level 3
EN61000-4-3 (RS), level 3
EN61000-4-4 (EFT), level 3
EN61000-4-5 (Surge), level 3
EN61000-4-6 (CS), level 3
EN61000-4-8
EN61000-4-11
EMI: FCC Part 15, CISPR (EN55022) class A
EN50155: 2007: Performance, shock, vibration, temperature, EMC
IEC60571 (Edition2.1, 2006-12): Performance, shock, vibration, temperature, EMC

Warranty

Warranty Period: 5 years
Details: See www.moxa.com/warranty

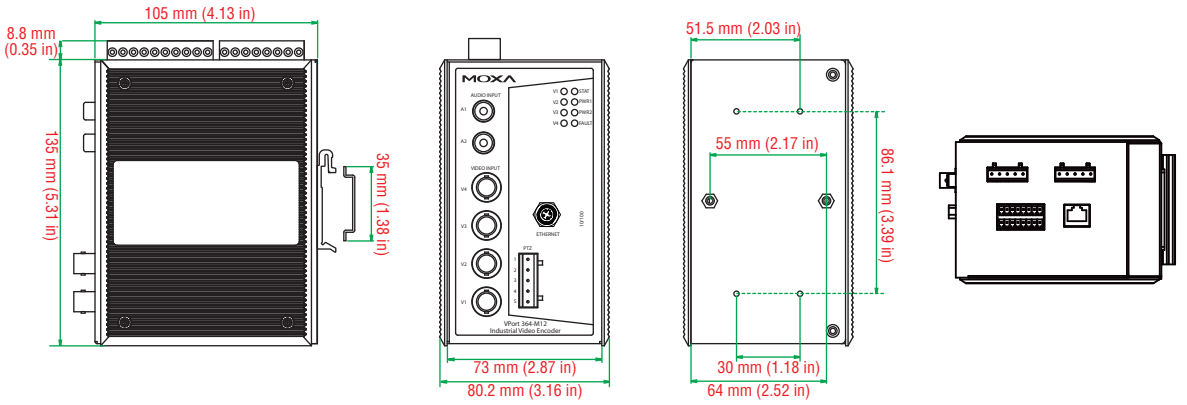
System Requirements

CPU: Pentium 4, 2.4 GHz or above
Memory: 512 MB memory or above
OS: Windows XP/2000 with SP2 or above
Browser: Internet Explorer 6.x or above
Multimedia: DirectX 9.0c or above

Software Bundled Free

VPort SDK PLUS: Includes CGI commands, ActiveX Control, and API library for customized applications or system integration for third-party developers (the latest version of SDK is vailable for download from Moxa's website).

Dimensions



Side View | Front View | Rear View | Top View

Ordering Information

Available Models

VPort 364-M12: 4-channel H.264/MJPEG Industrial Video Encoder, M12 Ethernet connector, 0 to 60°C operating temperature
VPort 364-M12-T: 4-channel H.264/MJPEG Industrial Video Encoder, M12 Ethernet connector, -40 to 75°C operating temperature

Optional Accessories (can be purchased separately)

SoftNVR-IA: 32-channel IP surveillance software for industrial automation applications
DR-4524/75-24/120-24: 45/75/120 W DIN-Rail 24 VDC power supplies
MDR-40-24/60-24: 40/60 W DIN-Rail 24 VDC power supplies, -20 to 70°C operating temperature
RK-4U: 4U-high 19" rack mounting kit